

Science Abstracts

**Completion of Volume 69 of
Science Abstracts**

The publication of this Index issue completes volume 69 (1966) of this Section of Science Abstracts. The suggested order for the binding of the various issues making up this volume is as follows: Part I comprising the January-June issues, Author Index Part I, Subject Index Part I; Part II comprising the July-December issues, Author Index Part II, and Subject Index Part II. The title page together with the preliminary pages which should be bound at the beginning of each Part are to be found at the beginning of each Author Index. The Author Index published with each monthly issue should *not* be bound as all the entries have been cumulated into their respective half-year Author Indexes.

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SUBJECT INDEX-PART II

INTRODUCTION

The entries in this index refer to the abstracts by their serial number, not by the page number. The entries are grouped under headings (printed in bold type, e.g. "Abrasion") which represent, in the main, general categories or concepts rather than specific names. If a heading for a particular subject does not appear, a more general heading should be consulted; for example, "Zone plates" would be listed under "Diffraction/light"; "Barkhausen discontinuities" under "Magnetization process". There are numerous cross-references directing attention to related headings in other parts of the index.

Many of the headings are subdivided by the use of subheadings, which are indented (i.e. printed slightly to the right) and commence with a small letter (for example, see the subheadings under "Absorption").

ARRANGEMENT OF HEADINGS AND SUBHEADINGS

The headings are arranged throughout the index in alphabetical order according to British Standard 1749:1951 (the "word by word" system, not "reading right through"). The subheadings, with a few exceptions, are themselves arranged in alphabetical order under their respective headings. The exceptions (for example, see the subheadings under "Spectra", "Crystal structure, atomic") are cases where a more logical order is preferable to a purely alphabetical one.

ARRANGEMENTS OF ENTRIES UNDER HEADINGS

Entries are arranged in two alphabetical groups as follows. First group: generalities and named substances (in words); second group: named substances (chemical formulae). If a search is being made for a particular substance, both the first and second alphabetical groups should be inspected since, for example, alumina may also be listed as Al_2O_3 .

COLLECTED LIST OF SUBJECT HEADINGS

The alphabetical arrangement of the headings is the most convenient for locating a known heading quickly, but there may be other related headings elsewhere in the index of which the reader is unaware, and which he would only come across by accident. To assist the reader to discover all the headings appropriate to his subject, a collected list of the headings is given on pages S424 to S438, which follow this page; they should be consulted as a matter of routine each time a search is made. In this list, the headings are not arranged in alphabetical order, but are grouped into sections by subject on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. By using this list, the reader can quickly determine which are the headings appropriate to his subject, and they are then easily found in the main index in their alphabetical position.

HEADINGS WITH NO ENTRIES

Because physics is a developing subject, it is not possible to maintain the list of headings unchanged from year to year; it is subject to a continuous process of revision, with the introduction of new headings and subheadings, and the alteration and elimination of old ones. This process is a gradual one, however, and the great majority of the headings are the same as those of the previous year. To assist in maintaining the continuity of the index, all the headings in current use in a given year are printed, even those for which there are no abstracts to be recorded. The latter are followed by the announcement "No entries"; this supplies confirmation that these headings have not been dropped from the index, and entries may reappear under them in the next issue of the index.

ELEMENTS, COMPOUNDS AND OTHER SUBSTANCES

The names of elements, their compounds, a few compounds of special interest (e.g. "Ruby", "Water") and a few common materials (e.g. "Wood", "Paper") are included as headings or subheadings (e.g. "barium titanate" under "Barium compounds"). Under these, as well as under the appropriate "subject" headings, are listed any abstracts which contain significant physical information about the element, compound or substance named; except however, that abstracts listed under headings referring to nuclear properties, including radioactivity, are not necessarily also listed under the substance name. The entries under these headings are themselves arranged in alphabetical order of substance or nuclide names, so that a given substance can be readily located.

Inorganic compounds of the elements are listed under the first element in the chemical formula, and all the compounds of a given element are grouped under a single heading (e.g. "Sodium compounds"). Alloys are listed under compounds of the base or first-named constituent, e.g. Au-Ag alloys under "Gold compounds". There are also four special headings for the common alloys: "Aluminium alloys", "Copper alloys", "Iron alloys", "Nickel alloys". Organic compounds are grouped under "Organic compounds", "Polymers", "Plastics" and under special substance headings such as "Paper", "Proteins", etc.; all the latter are listed in the collected list of headings at the end of the index.

BEFORE USING INDEX, CONSULT LIST OF SUBJECT HEADINGS ON PAGES S424-S438, WHICH FOLLOW THIS PAGE

LIST OF SUBJECT INDEX HEADINGS

The headings used in the Alphabetical Index are listed below. The headings are grouped into sections on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. Each section lists the headings which concern its subject and it follows that many of the headings are listed in several places.

An introduction to the Subject Index will be found on page S423.

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Biographies
Books

Collections of physical data
Conferences
History

Laboratories
Laboratory apparatus and technique
Nomenclature and symbols

Physics
Physics fundamentals
Reviews

EDUCATION

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Books
History

Laboratories
Laboratory apparatus and technique

Physics
Physics fundamentals

Reviews
Teaching demonstrations

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Alignment
Anemometers
Angle measurement
Angular velocity measurement
Area measurement
Balances
Constants
Density measurement

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Instruments
Interferometry
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Manometers
Measurement errors

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Micrometry
Nomenclature and symbols
Particle size
Pressure measurement
Recording
Standards
Strain gauges
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Time measurement
Units
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Velocity measurement
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Fourier analysis
Functions

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Deformation
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Elasticity
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Relativity
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special
unified field theories

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Fermions
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Kinetic theory
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Random processes
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Thermodynamics

Thermodynamics

Entropy
properties of substances
Equations of state
gases
liquids
solids

Joule — Thomson effect
Thermodynamic properties
Thermodynamics applications

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Radiative transfer
Transport processes

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 Vibrations
 Waves

VIBRATIONS · ELASTIC WAVES

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 Membranes
 Oscillations
 Piezoelectric oscillations
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 effects
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 Vibrations
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 Diffusion/
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 Intensity measurement/
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 Interference/
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 Interferometers/
 acoustic waves
 Interferometry/
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 Noise/
 acoustic
 Noise abatement
 Physical effects of radiations
 Radiation pressure

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 acoustic waves, ultrasonic
 Refraction/
 acoustic waves
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 Speech
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Ear
 Hearing

Noise/
 acoustic
 Speech

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 [and effects]

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 heat
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 Radiative transfer
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 Thermometers
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 Low-temperature production

Low-temperature technique
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 many-particle systems
 Superconductivity

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Helium/
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 liquid, sound propagation
 solid
 Superfluidity

ELECTRICITY AND MAGNETISM

Electricity
Electromagnetism
Magnetism

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AND CIRCUITS**

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Circuits	High-voltage production
Counting circuits	Image converters and amplifiers
Dielectric measurement	Plasma/ measurement technique
Electrical measurement	

Direct Conversion

Electricity/
direct conversion
Magnetohydrodynamics

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Contact potential	Ferroelectric phenomena
Dielectric devices	High-voltage production
Dielectric phenomena	Hysteresis
Electrets	Piezoelectric oscillations
Electric charge	Piezoelectricity
Electric fields	Pyroelectricity
effects	Relaxation
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Electrostatics	

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Electric charge	Photovoltaic effects
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Electrokinetic effects	Rectifiers
Electromotive force	Resistance, electrical
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Fluctuations/ electrical	Thermocouples
	Thermoelectricity

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Diamagnetism	Magnetization process
Ferrimagnetism	Magnetization state
Ferromagnetism	Magnetoacoustic effects
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Gyromagnetic effect	Magnetomechanical effects
Gyromagnetic ratio	Magneto-optical effects
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Magnetic fields	Magnets
effects	Paramagnetism
Magnetic films	

ELECTROMAGNETISM

Eddy-currents
Electromagnetism
Electromagnetic fields
Electromotive force
Inductance

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Particle optics	Particle velocity analysis

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Electron diffraction	ionization
Electron gas	radiation
Electron lenses	scattering
electrostatic	Fluctuations/ electrical
magnetic	Gas-discharge tubes
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Electron microscopy	Photomultipliers
Electron optics	Space charge
Electron tubes	

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effects	Ions
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Ion optics	scattering
	Sputtering

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 Diffusion/
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 Electromagnetic oscillations
 Electromagnetic wave
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Interference/
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 Interferometers/
 electromagnetic waves
 Interferometry/
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 electromagnetic waves
 Scattering/
 electromagnetic waves

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 [relaxation
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Amplifiers
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 Optical pumping

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 Optical instrument testing

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Neutron spectrometers
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Particle detectors
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Counting circuits

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Tritons

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 Mesons/
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 cosmic rays
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 electrons
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 neutrinos
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 protons
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 Photons/
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 Scattering, particles

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 Chemical analysis/
 by nuclear reactions
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 Radiochemistry
 Thermonuclear reactions

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Orbital calculation methods
Quantum theory

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Luminescence
gases
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Orbital calculation methods
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Isotopes

Isotope effects
Isotope exchanges
Isotope separation
Isotopes
detection
relative abundances
Mass spectra

Mass spectrometers/
applications
Radioactive dating
Radioactive tracers
Radiochemistry
Tracers

Mesic Atoms

Atoms, mesic

MOLECULES

Molecules

**Structure · Internal Mechanics
Spectra**

Bonds
Chemical structure
Isomerism
Luminescence
gases
Molecular weight
Molecules
configuration and dimensions
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electronic structure
electronic structure, inorganic
electronic structure, organic
nuclear coupling
rotation
vibration
moments
Optical pumping

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organic
Spectra
inorganic molecules
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diatomic, radiofrequency
polyatomic
polyatomic, radiofrequency
inorganic liquids and solutions
inorganic solids
radiofrequency
organic molecules and substances
infrared
radiofrequency
Spectral line breadth
Stark effect
Valency
Zeeman effect

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Magnetic resonance and
relaxation
Molecules/
nuclear coupling
relaxation

Nuclear magnetic resonance
[and relaxation]
Nuclear quadrupole resonance
Paramagnetic resonance and
relaxation

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Free radicals
Heat of dissociation

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Molecules/
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Macromolecules · Polymers

Association
Heat of formation
Isomerism
Macromolecules

Molecules/
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Proteins

Mesic Molecules

Molecules, mesic

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Arcs, electric
Breakdown, electric
gases
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glows
high-frequency
Gas-discharge tubes
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Sparks, electric
Sputtering

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Dissociation
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Ionization
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Ionization potential
Ionization, surface

Ions
recombination
scattering
Shock waves/
effects
Space charge

PLASMA

Discharges, electric
glows
high-frequency
Electron gas
Ionization
gases
Nuclear fusion
Nuclear reactors, fusion

Plasma
electromagnetic wave propagation
magnetohydrodynamics
measurement techniques
Shock waves/
effects
Space charge
Thermonuclear reactions

Plasma Confinement

Plasma/
confinement

Plasma Oscillations and Stability

Plasma/
magnetohydrodynamics
oscillations
stability

Plasma Devices

Nuclear reactors, fusion
Plasma/
devices

FLUIDS

Flow
Fluids
Hydrodynamics
Hydrostatics

Oscillations
Turbulence
Viscosity
Vortices
Waves

MECHANICS OF GASES

Acoustic streaming
Aerodynamics
Anemometers
Compressibility/
gases
Condensation
Density/
gases
Diffusion in gases
thermal
Flow/
gases
Flowmeters
Gases
Humidity

Hygrometers
Jets
Manometers
Moisture
Pressure
Pumps
Radiation pressure
Supersonic flow
Turbulence
Viscometers
Viscosity/
gases
Vortices
Waves

GASEOUS STATE

Absorption/
acoustic waves
acoustic waves, ultrasonic
electromagnetic waves
light
Association/
gases
Breakdown, electric/
gases
Conductivity, electrical/
gases
measurement
Conductivity, thermal/
gases
measurement
Dielectric properties of substances/
gases
Diffraction/
acoustic waves
acoustic waves, ultrasonic
electromagnetic waves
light
Diffusion/
acoustic waves
electromagnetic waves
light
Electrical properties of substances
Electroluminescence
Equations of state/
gases
Gases
Helium/
gas
Interference/
acoustic waves
Joule-Thomson effect
Kinetic theory/
gases
Lasers/
gaseous
Luminescence/
gases

Magnetic resonance and relaxation
Molecules/
intermolecular mechanics
Nuclear magnetic resonance and relaxation
Nuclear quadrupole resonance
Optical properties of substances
Paramagnetic resonance and relaxation
Reflection/
acoustic waves
acoustic waves, ultrasonic
electromagnetic waves
light
Refraction/
acoustic waves
acoustic waves, ultrasonic
electromagnetic waves
light
Scattering/
acoustic waves
acoustic waves, ultrasonic
electromagnetic waves
light
Sorption
Specific heat/
gases
Spectra
Statistical mechanics
Thermoluminescence
Transmission/
acoustic waves
acoustic waves, ultrasonic
light
Velocity/
acoustic waves
acoustic waves, ultrasonic

Viscosity • Diffusion

Diffusion in gases
thermal
Transport processes
Viscosity/
gases

VACUUM PHYSICS

Glass-metal seals
Leak detection
Manometers
Sputtering

Vacuum apparatus
Vacuum gauges
Vacuum pumps
Vacuum technique

MECHANICS OF LIQUIDS

Acoustic streaming	Drops	Hydrostatics	Sprays
Bubbles	Elasticity/ liquids	Jets	Surface energy
Capillarity	Emulsions	Liquid oscillations	Surface tension
Cavitation	Films/ liquid	Liquid waves	Surface tension measurement
Compressibility/ liquids	Filters	surface	Thixotropy
Density/ liquids	Flow/ liquids	Lubrication	Turbulence
Diffusion in liquids	Flowmeters	Moisture	Viscometers
thermal	Foams	Pressure	Viscosity/ liquids
Double refraction/ flow	Hydrodynamics	Pumps	Vortices
		Radiation pressure	Wetting
		Rheology	
		Schlieren systems	

LIQUID STATE**Liquids****Theory and Structure of Liquids**

Association/ liquids	Liquids structure
Electron diffraction examination	theory
Equations of state/ [of materials]	Neutron diffraction examination of liquids [materials]
Films/ liquid	scattering
Heat of solution	Polymers
Liquid crystals	Solubility
	Solutions
	X-ray examination of materials/ liquids

Viscosity • Surface Tension • Diffusion

Diffusion in liquids	Sorption
thermal	Surface tension
Filters	Surface tension measurement
Membranes	Transport processes
Osmosis	Viscosity/ liquids

Optical Properties of Liquids

Absorption/ electromagnetic waves	Raman spectra
light	inorganic
Diffraction/ electromagnetic waves	organic
light	Reflection/ electromagnetic waves
Diffusion/ electromagnetic waves	light
light	Refraction/ electromagnetic waves
Double refraction	light
flow	Scattering/ electromagnetic waves
Electroluminescence	light
Luminescence/ liquids and solutions	Spectra/ inorganic liquids and solutions
Optical pumping	Thermoluminescence
Optical properties of substs.	Transmission/ light

Aerosols	Filters
Centrifuges	Foams
Colloids	Gels
Disperse systems	Heat of solution
Electrophoresis	Membranes
Emulsions	

Boiling
Boiling point
Condensation
Critical constants, thermal
Distillation
Drying

Equations of state
gases
liquids
solids
Evaporation
Freezing
Heat of fusion

Thermal Properties of Liquids

Conductivity, thermal/ liquids	Specific heat/ liquids
measurement	Thermal expansion
Heat of solution	Thermodynamic properties

Acoustical Properties of Liquids

Absorption/ acoustic waves	Refraction/ acoustic waves
acoustic waves, ultrasonic	acoustic waves, ultrasonic
Acoustic wave propagation	Scattering/ acoustic waves
ultrasonic	acoustic waves, ultrasonic
Diffraction/ acoustic waves	Transmission/ acoustic waves
acoustic waves, ultrasonic	acoustic waves, ultrasonic
Diffusion/ acoustic waves	Velocity/ acoustic waves
Interference/ acoustic waves	acoustic waves, ultrasonic
Reflection/ acoustic waves	
acoustic waves, ultrasonic	

Electrical and Magnetic Properties of Liquids

Abso. ption/ electromagnetic waves	Ionization, liquids
Breakdown, electric/ liquids	Magnetic properties of substs.
Conductivity, electrical/ liquids	Magnetic resonance and relaxation
liquids, electrolytic	Metals
measurement	Nuclear magnetic resonance and [relaxation]
Dielectric properties of substs./ liquids and solutions	Nuclear quadrupole resonance
Electrical properties of substs.	Paramagnetic resonance and [relaxation]
	Semiconducting materials
	Semiconductors

DISPERSIONS • COLLOIDS

Osmosis	Solubility
Particle size	Solutions
Precipitation	Surface phenomena
Sedimentation	Suspensions
Sols	Thixotropy

CHANGE OF STATE

Heat of sublimation	Phase equilibrium
Heat of transformation	Phase transformations
Heat of vaporization	Sublimation
Humidity	Supercooling
Liquefaction, gases	Vapour pressure
Melting	Vapour pressure measurement
Melting point	Vaporization

SOLID-STATE PHYSICS

Bonds
Crystals
 internal fields
Crystal properties

Equations of state/
 solids
Metals
 theory

Mössbauer effect
Nuclear orientation
Orbital calculation methods

Solids
 structure
 theory

STRUCTURE OF SOLIDS · ALLOYS

Alloys
Crystal structure
Density/
 solids
Fibres
Filters
Granular structure
Heat treatment
 alloys
Membranes

Particle size
Permeability, mechanical
Polymorphism
Porous materials
Powders
Sintering
Solids
 structure
Solid solutions
Solubility

MICROSTRUCTURE OF SOLIDS

Amorphous state
Crystal structure/
 microstructure
Electron diffraction examination
 [of materials]
Electron microscope examination
 [of materials]
Electron microscopy
Fibres
Granular structure
Ion microscopes

Metallurgy
Microscopy
Neutron diff. exam. of materials
Particle size
Porous materials
Powders
Radiography
Surface texture
X-ray examination of materials
 microstructure
 molecular structure

Solid-State Phase Transformations

Heat treatment
 alloys
Phase equilibrium

Phase transformations/
 solid-state
Polymorphism
Precipitation

Surfaces

Surface energy
Surface measurement

Surface phenomena
Surface texture

Films

Evaporation
Films/
 solid

Sputtering
Sublimation

Adsorption

Adsorbed layers
Adsorption

Heat of adsorption
Sorption

NON-CRYSTALLINE STATE

Amorphous state
Glass
Plastics
Polymers

Rubber
Vitreous state
Waxes

CRYSTALLOGRAPHY

Crystal chemistry
Crystal properties
Crystal structure
Crystallization
Crystallography
Crystals
 etching
 faces
 growth
 orientation
 twinning
 whiskers

Minerals
Polymorphism
Precipitation
Solids/
 structure
Surface texture
Zone melting and refining

CRYSTAL LATTICE STRUCTURES

Crystal structure, atomic
 elements
 alloys
 inorganic compounds
 organic compounds
Electron diffraction crystallography
Electron diffraction examination
 [of materials]
Electron microscope examination
 [of materials]
Neutron diffraction crystallography
Neutron diffraction examination
 [of materials]
Polymers

X-ray absorption
X-ray crystallography
 apparatus
 calculation apparatus
 calculation methods
 technique
X-ray diffraction
X-ray examination of materials
 molecular structure
X-ray measurement
X-ray monochromators
X-ray reflection
X-ray scattering
X-ray tubes

LATTICE MECHANICS

Crystals/
 lattice mechanics

Mössbauer effect

ACOUSTICAL PROPERTIES OF SOLIDS

Absorption/
 acoustic waves
 acoustic waves, ultrasonic
Acoustic wave propagation
 ultrasonic
Acoustoelectric effects
Diffraction/
 acoustic waves
 acoustic waves, ultrasonic
Dispersion, acoustic
 ultrasonic
Magnetoacoustic effects

Reflection/
 acoustic waves
 acoustic waves, ultrasonic
Refraction/
 acoustic waves
 acoustic waves, ultrasonic
Scattering/
 acoustic waves
 acoustic waves, ultrasonic
Transmission/
 acoustic waves
 acoustic waves, ultrasonic
Velocity/
 acoustic waves
 acoustic waves, ultrasonic

THERMAL PROPERTIES OF SOLIDS

Conductivity, thermal/
 measurement
 solids
Equations of state/
 solids

Heat conduction
Specific heat/
 solids
Thermal expansion
Thermodynamic properties

DIFFUSION IN SOLIDS

Diffusion in solids

Permeability, mechanical

DEFECT PROPERTIES OF SOLIDS

Cold working

Electron diffraction examination

Creep [of materials]

Crystal imperfections Electron microscope examination

dislocations Heat treatment [of materials]

interstitials alloys

vacancies Internal friction

Crystal structure Neutron diffraction examination

Crystals Plastic deformation [of materials]

etching Plastic flow

twinning Slip

Deformation Stresses, internal

Elastic deformation Work hardening

X-ray examination of materials/
microstructure**Colour Centres**Absorption/
lightX-rays/
effects

Colour centres

RADIATION EFFECTS IN SOLIDSAcoustic waves/
effectsIon beams/
effectsAlpha-rays/
effectsMesons/
effectsBeta-rays/
effectsNeutrons and antineutrons/
effectsDeuterons/
effects

Physical effects of radiations

Electron beams/
effectsProtons and antiprotons/
effectsGamma-rays/
effects

Sputtering

Hyperons/
effectsX-rays/
effects**ELECTRICAL PROPERTIES OF SOLIDS**

Acoustoelectric effects

Contact resistance

Conduction, electrical Crystal electron states

Conductivity, electrical/
measurement

Eddy-currents

solids Electrical properties of substs.

Contact potential Electron gas

Metals · Conductors

Electron gas

Metals

Hall effect theory

Magnetoelectric effects Piezoresistance

Magnetoresistance Skin effect

Superconductivity

Superconductivity

Superconducting Materials and Devices

Superconducting materials and devices

Semiconductors

Acoustoelectric effects

Hall effect

Contact potential Magnetoelectric effects

Contact resistance Magnetoresistance

Electron gas Magnetothermal effects

Electro-optical effects Piezoelectricity

Fluctuations/
electrical

Piezoresistance

Semiconductors

Space charge

Semiconducting DevicesCounters/
semiconductor

Semiconducting materials

Semiconducting devices

gallium arsenide diodes

germanium p-n junctions

indium antimonide transistors

silicon tunnel diodes

Rectifiers

MECHANICAL PROPERTIES OF SOLIDS

Abrasion

Internal friction

Adhesion

Lubrication

Bending

Magnetomechanical effects

Brittleness

Mechanical properties of substs.

Cold working

Mechanical strength

Compressibility compressive

Corrosion shear

Cracks tensile

Creep

Photoelasticity

Deformation

Physical effects of radiations

Density/
solids

Plastic deformation

Elastic constants

Plastic flow

measurement

Plasticity

Elastic deformation

Rheology

Elastic fatigue

Slip

Elastic limit

Strain gauges

Elastic relaxation

Stress analysis

Elasticity

Stress effects

Fracture

Stress/strain relations

Friction

Stresses, internal

Hardness

Thermoelasticity

Heat treatment

Thixotropy

alloys

Torsion

High-pressure phenomena

Viscoelasticity

Hysteresis [and effects]

Wear

Impact

Work hardening

ELECTRON STATES IN SOLIDS

Crystal electron states

Electron pairs/
annihilation

excitons

Electrons

Fermi level

absorption

Fermi surface

radiation

plasma

scattering

polarons

Hall effect

surface

Magnetoacoustic effects

Crystal properties

Metals

Cyclotron resonance

theory

Electron beams/
effects

Piezoresistance

Electron gas

Solids

theory

Surface phenomena

Electro-optical effects

Magnetothermal effects

Fluctuations/
electrical

Piezoelectricity

Hall effect

Piezoresistance

Magnetoelectric effects

Resistance, electrical

Magnetoresistance

Space charge

Dielectrics

Breakdown, electric/
solids

Electrostriction

Contact potential

Ferroelectric materials

Dielectric devices

barium titanate

Dielectric measurement

Ferroelectric phenomena

Dielectric phenomena

Hysteresis

Dielectric properties of substs./
solids

Piezoelectric oscillations

Electrets

Piezoelectricity

Electric charge

Pyroelectricity

Electric fields

Relaxation

Electric strength

Rochelle salt

Space charge

Trielectricity

THERMOELECTRIC PROPERTIES OF SOLIDS

Thermocouples

Thermoelectricity

PHOTOCONDUCTIVITY · PHOTOVOLTAIC EFFECTS

Photoconductivity

Photoelectromagnetic effects

Photoelectricity

Photovoltaic effects

ELECTRON AND ION EMISSION BY SOLIDS

Cathodes

Ion emission

oxide

secondary

Electron emission

thermionic

field emission

Ionization/
solids

photoelectric

Ionization, surface

secondary

Work function

thermionic

MAGNETIC PROPERTIES OF SOLIDS

- | | | | |
|----------------------------------|--------------------|--------------------------------|---------------------------------|
| Antiferromagnetism | Ferromagnetism | Magnetic properties of substs. | Magnetoacoustic effects |
| de Haas-van Alphen effect | spin-wave theory | antiferromagnetic | Magnetoelectric effects |
| Diamagnetism | Gyromagnetic ratio | diamagnetic | Magneto-optical effects |
| Electron diffraction examination | Hall effect | ferrimagnetic | Magnetoresistance |
| [of materials] | Hysteresis | ferromagnetic | Magnetostriction |
| Electron microscope examination | Magnetic devices | paramagnetic | Magnetochemical effects |
| [of materials] | Magnetic fields/ | transitions | Neutron diffraction examination |
| Ferrimagnetism | effects | Magnetism | [of materials] |
| Ferrites | Magnetic films | Magnetization process | Paramagnetism |
| | | Magnetization state | Zeeman effect |
| | | domains | |

Paramagnetic Properties

- | | |
|------------------------------------|---------------|
| Magnetic properties of substances/ | Paramagnetism |
| paramagnetic | |

Ferromagnetic Properties

- | | |
|------------------|------------------------------------|
| Ferromagnetism | Magnetic properties of substances/ |
| spin-wave theory | ferromagnetic |
| Hysteresis | Magnetization process |
| Magnetic devices | Magnetization state |
| Magnetic films | domains |

Ferrimagnetic Properties - Ferrites

- | | |
|------------------|---------------------------------|
| Ferrimagnetism | Magnetic films |
| Ferrites | Magnetic properties of substs./ |
| Hysteresis | ferrimagnetic |
| Magnetic devices | |

Antiferromagnetic Properties

- | | |
|--------------------|---------------------------------|
| Antiferromagnetism | Magnetic properties of substs./ |
| | antiferromagnetic |

MAGNETIC RESONANCES IN SOLIDS

- | | | | |
|-----------------------------|--------------------------|-----------------------------------|------------------------------|
| Antiferromagnetic resonance | Ferromagnetic relaxation | Magnetic resonance and relaxation | Nuclear quadrupole resonance |
| Cyclotron resonance | Ferromagnetic resonance | Magnetomechanical effects | Optical pumping |
| Ferrimagnetic resonance | Gyromagnetic ratio | Nuclear magnetic resonance and | Paramagnetic resonance and |
| | | measurement [relaxation] | measurement [relaxation] |

OPTICAL PROPERTIES OF SOLIDS

- | | | | |
|------------------------------|----------------------------------|-----------------------|-----------------------|
| Absorption/ | Lasers/ | Refraction/ | Spectral line breadth |
| electromagnetic waves | solid | electromagnetic waves | Stark effect |
| light | Magneto-optical effects | light | Transmission/ |
| Diffraction/ | Optical constants | light | light |
| electromagnetic waves | Optical films | Refractive index/ | Transparency |
| light | Optical materials | light | Velocity/ |
| Diffusion/ | Optical properties of substances | Scattering/ | light |
| electromagnetic waves | Optical pumping | electromagnetic waves | X-ray spectra |
| light | Optical rotation | light | absorption |
| Dispersion, optical | Photoelasticity | Spectra/ | emission |
| Double refraction | Pleochroism | inorganic solids | Zeeman effect |
| mechanical | Polarized light | radiofrequency | |
| Electromag. wave propagation | Raman spectra | organic molecules and | |
| Electro-optical effects | inorganic | infrared [substances] | |
| Emissivity | organic | radiofrequency | |
| Interference/ | Reflection/ | | |
| light | electromagnetic waves | | |
| | light | | |
| | Reflectivity | | |

Luminescence of Solids

- | | |
|-------------------------|---------------------|
| Colour centres | Luminescence/ |
| Counters, scintillation | solids, inorganic |
| Electroluminescence | solids, organic |
| | Luminescent devices |
| | Thermoluminescence |

PHYSICAL CHEMISTRY

- | | | | |
|------------------------|---------------------|-------------------------------|--------------------|
| Atomic mass and weight | Distillation | Laboratory app. and technique | Physical chemistry |
| Balances | Elements | Macromolecules | Precipitation |
| Bonds | origin | Molecular weight | Pumps |
| Centrifuges | relative abundances | Molecular weight determin. | Quantum chemistry |
| Chemical structure | Filters | Periodic system | Sedimentation |
| Chemical technology | Isomerism | | Valency |

THERMOCHEMISTRY - REACTIONS

- | | |
|---------------------|-----------------------|
| Association | Heat of adsorption |
| gases | Heat of combustion |
| liquids | Heat of dissociation |
| Catalysis | Heat of formation |
| Chemical reactions | Heat of reaction |
| Combustion | Isotope exchanges |
| Corrosion | Oxidation |
| Crystal chemistry | Phase equilibrium |
| Detonation | Phase transformations |
| Dissociation | Polymerization |
| Exchanges, chemical | Polymers |
| Explosions | Reaction kinetics |
| Flames | Sorption |

ELECTROCHEMISTRY

- | | |
|---------------------------|-------------------------|
| Conductivity, electrical/ | Electrolysis |
| liquids, electrolytic | Electrolytic deposition |
| Dissociation/ | Electrophoresis |
| electrolytic | Ion velocity/ |
| Electrochemistry | electrolytic |
| electrodes | Ions, electrolytic |
| Electrokinetic effects | |

PHOTOCHEMISTRY**RADIATION CHEMISTRY****RADIOCHEMISTRY**

- | | |
|--------------------------------|--------------------|
| Chemical effects of radiations | Nuclear reactions/ |
| acoustic waves | chemical effects |
| ionizing radiations | Photochemistry |
| | Radiochemistry |

PHYSICAL METHODS OF CHEMICAL ANALYSIS

- | | |
|----------------------|--------------------------|
| Chemical analysis | Chromatography |
| adsorption | Radioactive tracers |
| by mass spectrometry | Spectrochemical analysis |
| by nuclear reactions | Tracers |
| electrochemical | |
| radioactive | |
| X-ray | |

GEOFYSICS

Earth
age
composition
electricity
heat
rotation

Geodesy
Geophysical prospecting
Geophysics
Glaciers

Gravity
Minerals
Oceanography
Radioactive dating

Radioactivity
Seawater
Seismic waves
Seismology
Soil

ATMOSPHERE

Anemometers
Atmosphere
composition
humidity
movements
precipitation
radioactivity
structure
temperature
thermodynamics

Atmospheric acoustics
Atmospheric electricity
Atmospheric optics
Atmospheric pressure and
[density
Atmospheric spectra
Atmospherics
Clouds
Condensation

Electromagnetic wave
atmosphere [propagation
Evaporation
Fallout
Fog
Humidity
Hygrometers
Ice
Lightning
Meteorological instruments

Meteorology
Rain
Rockets
Satellites, artificial
Sky brightness
Snow
Sunlight
Thunderstorms
Twilight
Wind

UPPER ATMOSPHERE

Airglow
Atmosphere
composition
movements
radiation belts
radioactivity
structure
temperature
thermodynamics
upper
Atmospheric electricity
Atmospheric optics
Atmospheric pressure and
[density

Atmospheric spectra
Atmospherics
Aurora
Fallout
Ionization, atmosphere
Meteoroids
Rockets
Satellites, artificial
Sky brightness
Sunlight
Twilight
Zodiacal light

Ionosphere

Atmospherics
Aurora
Electromag. wave propagation
ionosphere
Ionization, atmosphere

Ionosphere
D-region
E-region
F-region
Ionosphere meas. apparatus

SPACE RESEARCH TECHNIQUES

Rockets
Satellites, artificial
Space research

Space vehicles
instrumentation

GEOMAGNETISM

Compasses
Earth/
magnetic field
magnetic field, variations

Magnetic storms
Rock magnetism

ASTROPHYSICS

Astronomical instruments
Astronomical observations
Astronomical spectra
Astronomy and astrophysics
Celestial mechanics
Cosmic rays
Cosmology

Elements/
origin
relative abundances
Gravitation
Interstellar matter
Telescopes/
astronomical

STARS · GALAXIES

Cosmic radiations, r.f.
Galaxies
the Galaxy
Interstellar matter
Magnetohydrodynamics
Nebulae
Novae

Stars
composition
magnetism
radiation
spectra
structure
Thermonuclear reactions

SOLAR SYSTEM · SUN

Comets
Cosmic rays
Earth
rotation
Gravitation
Interplanetary magnetic field
Interplanetary matter
Meteorites
Meteoroids
Moon
Planets
Solar system

Sun
corona
eclipses
flares
magnetism
prominences
radiation
radiation, corpuscular
radiation, r.f.
spectra
Sunspots
Zodiacal light

RADIOASTRONOMY TECHNIQUES

Cosmic radiations, r.f.

Radioastronomy

BIOPHYSICS

Biological effects of radiations
Biological technique and
[instruments
Biology
Biophysics
Blood
Dosimetry

Medical science
Physiology
Proteins
Radiation protection
Radiography
Zoology

TECHNIQUE · MATERIALS

Biological technique and instruments
Chemical technology
Heat treatment
alloys
Laboratory apparatus and technique
Leak detection
Low-temperature technique
Materials

Metallurgy
Vacuum technique
Zone melting and refining

**HIGH-PRESSURE
TECHNIQUES**

High-pressure phenomena
[and effects

LIST OF SUBJECT INDEX HEADINGS

SUBSTANCES

Chemical elements and inorganic compounds

All the chemical elements are listed by name, followed by their compounds, e.g. "Cadmium", "Cadmium compounds".

"Hydrogen" is subdivided by the subheadings "neutral atoms", "neutral molecules", and "ions". "Deuterium" and "Tritium" are independent headings. "Hydrogen compounds" is supplemented by "Ice", "Steam", and "Water".

"Oxygen" is supplemented by "Ozone", and "Carbon" is supplemented by "Diamonds" and "Graphite".

The following inorganic compounds are further subdivided by subheadings as shown:-

Barium compounds	Nitrogen compounds
barium titanate*	ammonia
Cadmium compounds	ammonium compounds
cadmium sulphide	Potassium compounds
Calcium compounds	potassium bromide
calcium fluoride	potassium chloride
Gallium compounds	Sodium compounds
gallium arsenide**	sodium chloride
Indium compounds	Zinc compounds
indium antimonide**	zinc sulphide
Lithium compounds	
lithium fluoride	

* Ferroelectric properties are listed under "Ferroelectric materials/barium titanate"

** Semiconducting properties are listed under the corresponding subheadings of "Semiconducting materials"

Organic compounds

Organic compounds are grouped under headings "Organic compounds", "Polymers", "Plastics", "Proteins". "Rochelle salt" is an independent heading.

Substance groups

In addition there are the following headings for groups of elements, compounds or substances:-

Actinides	Metals
Actinide compounds	Minerals
Alkali metals	Rare-earth metals
Alkali-metal compounds	Rare-earth compounds
halides	Semiconductors
Alkaline-earth metals	Semiconducting materials
Alkaline-earth compounds	gallium arsenide**
Ferrites	germanium**
Ferroelectric materials	indium antimonide**
barium titanate*	silicon**
Garnets	Transition metals
Halogens	Transition-metal compounds
Inert gases	

* Used for ferroelectric properties only

** Used for semiconducting properties only

Alloys

General papers on alloys are indexed under "Alloys". Alloys of specified composition are listed under, either

- (i) special alloy headings (there are five of them: "Aluminium alloys", "Copper alloys", "Iron alloys", "Nickel alloys", "Steel"), e.g. Al-Ni alloys under "Aluminium alloys", or
- (ii) compounds of the base or first-named element, e.g. Mn-Zn alloys under "Manganese compounds", and silicon-iron under "Iron alloys".

Special substances and materials

There are also the following special headings for certain common substances:-

Air	Paper
Blood	Porous materials
Ceramics	Powders
Clay	Quartz
Coal	Rubber
Concrete	Ruby
Fibres	Sand
Gelatin	Seawater
Glass	Soil
Mica	Waxes
Optical materials	Wood

ADP (ammonium dihydrogen phosphate). See Nitrogen compounds/ammonium compounds

Abacs. See Nomograms.

Aberrations, optical

See also Electron lenses; Ion optics; Optical instrument testing; Optics/geometrical; Particle optics.

astigmatism, axial, 1st and 2nd order, simultaneous correction 6=32807

catadioptric systems with two and three corrective elements 6=29213

chromatic, transfer function calc. 6=35782

chromatic, and transfer functions 6=35780

correction, theory 6=35790

Czerny-Turner spectrometer astigmatic compensation using concave cylinder grating 6=32833

effect on optical transfer function 6=35779

5th-order, in automatic lens design 6=35777

large-aperture systems 6=35797

lens design, optical transfer function 6=35772

lenses, correction by holograms 6=25703

Marechal balancing method appl. to mirrors 6=19535

non-rotationally symmetric systems 6=19536

photographic lenses, axial, rel. to transfer functions 6=22565

Ritchey Crétien corrector system 6=25704

rotating mirrors in streak cameras 6=25701

Schmidt corrector plates, construction 6=25712

Seidel astigmatism and Petzval curvature

generalization 6=29212

spherical mirror systems, analytical determ. 6=35771

synthesizers 6=35781

telescope objective calculations, Mosotti eqn. 6=19537

third-order wavefronts and null tests 6=35770

wave aberration, image evaluation method 6=35798

Abrasion

See also Hardness; Wear.

glass polishing, selected-area replication obs. 6=21175

grinder, precision sampling 6=24052

in photomechanical process, glow discharge

erosion 6=22568

sapphire, bending strength increase by flame polishing 6=37411

sapphire, strengths rel. to flame-polishing 6=21199

LiF, screw dislocations decrease on surface polishing, 20°C 6=37353

Zn tribomechanical detachment of building unit, stick-slip obs. 6=31350

Absorption

See also Subheadings of Alpha-rays; Beta-rays; Cosmic rays; Electrons; Gamma-rays; Hyperons; Mesons; Neutrons and antineutrons; Protons and antiprotons; and also Sorption; X-ray absorption.

in diffusely scattering medium 6=25758

ionic crystals, meas. apparatus 6=21087

H-Pd alloys, exothermic process, 1.2°-4.2°K 6=34316

acoustic waves

See also Noise abatement; Transmission/acoustic waves.

aerosol, by particulate-relaxation processes 6=34114

air, radiation pressure isotropic term obs. 6=30479

air, 2000-12500 c/s, -0.5 to 25.1°C, var.

humidity 6=30481

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- See also Ferromagnetic relaxation; Ferromagnetic resonance; Ferromagnetism; Magnetization process; Magnetization state.
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Night sky. See Airglow.

Nightglow. See Airglow.

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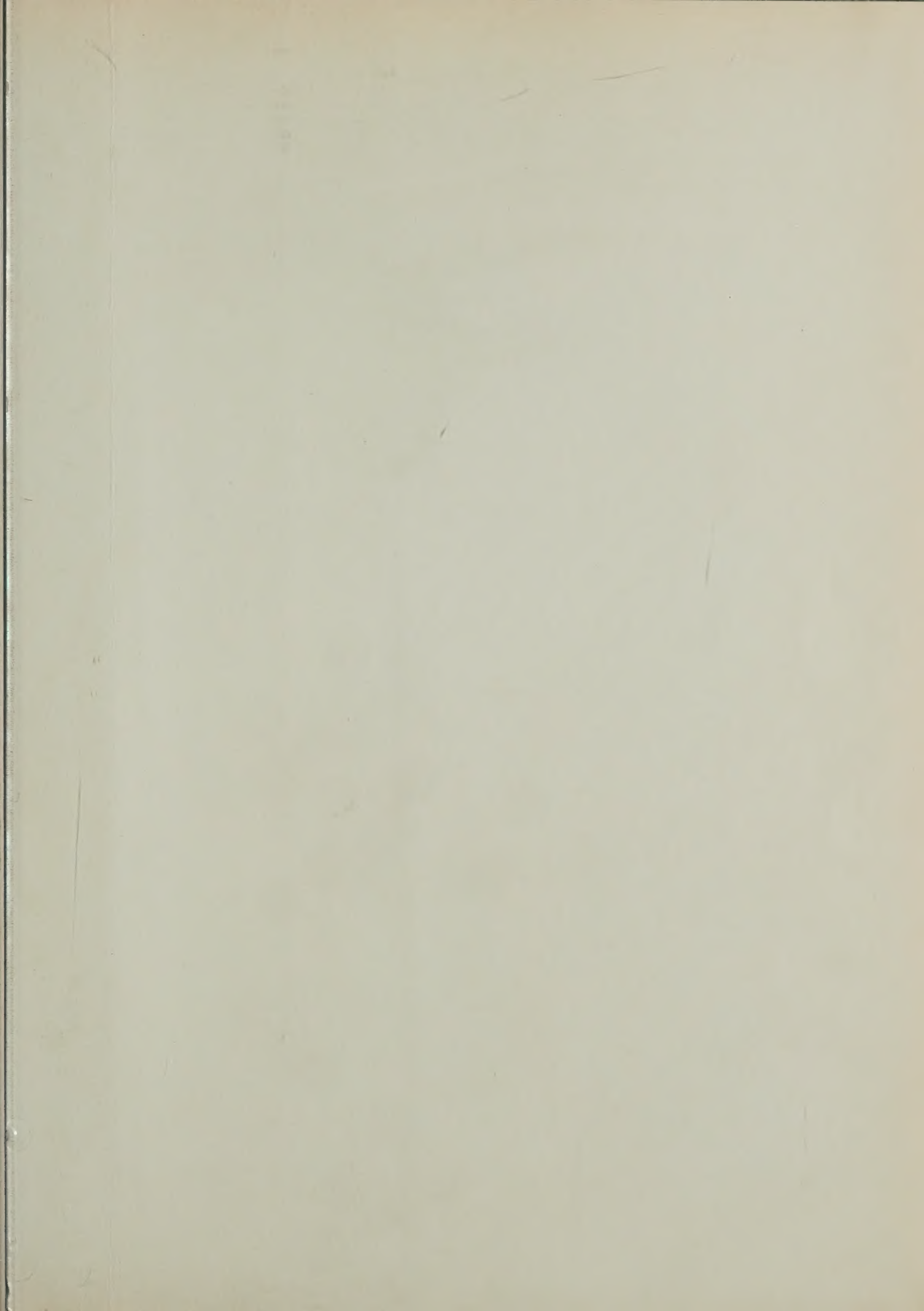
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